AMATEUR SATELLITE REPORT

AMSAT's Newsletter for the Amateur Space Program.

Number 53/54
March 28, 1983

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Amateur Satellite Report is endorsed by the American Radio Relay League as the special interest Newsletter serving the Amateur Radio Satellite Community

AMSAT Hires General Manager

After a search process lasting nearly 8 months, AMSAT has selected William L. Lazzaro, N2CF, of New York to be its new General Manager. The position also carries the title Executive Director.

The process of selection a GM/ED began with the Spring 1982 Board of Directors Meeting when the Directors authorized that a search committee be established to hire a qualified individual. The search committee was constituted in July with committee persons M. Saragovitz, W3IWI, K4YV, K1HTV, W6SP, KB4ZJ, W3GEY and WA2LQQ serving. AMSAT Treasurer Roy Rosner, K4YV, served as Chairperson. Advertisements were placed in major amateur radio magazines and newsletters. Other ads appeared in major newspapers. By November scores of resumes had been received. Finally, each committee person, acting independently, selected his top ten candidates from among all the resumes. A half dozen consensus candidates were interviewed in Washington. A group of three finalists was chosen and negotiations with the prime candidate, N2CF, began in January. In early March a majority of the Board ratified the agreement and N2CF thus became the second General Manager in AMSAT's history.

N2CF is a New York native in his early thirties, is married and has three boys. He holds an Extra ticket, has been licensed since 1964 and active on OSCAR since 1978. He is currently Activities Manager of the Orange County (N.Y.) Amateur Radio Club.

Bill holds a B.S. cum laude in Science Education and was President of his college honor society. In addition he earned a Masters in Science Education and has 30 post Master's credits towards his Doctorate.

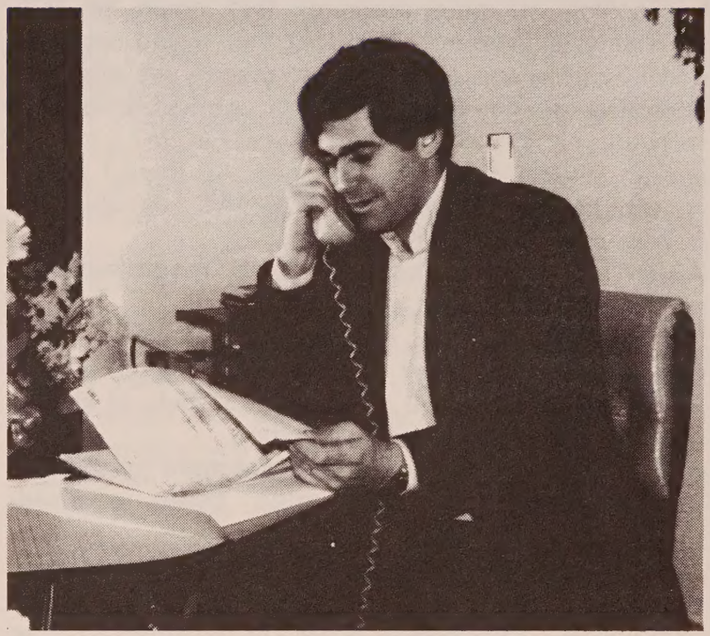
ASR recently interviewed N2CF to learn more about the plans, programs and philosophy he brings to the office.

ASR: How did you first become aware that AMSAT was looking for a General Manager?

N2CF: A ham friend pointed out an ad in the October '82 *QST* which, he said, appeared as if it had been written precisely for me. So I read it and it seemed like a pretty good match.

ASR: What do you mean, "A good match"?

N2CF: The job description just sounded as if it were



N2CF will soon be at work in the AMSAT Washington office.

describing me....what I do best. For example, my profession in science education meshed well with the requirement to develop programs in OSCAR education. My experience in obtaining federal grants to aid in my school science curriculum paralleled the requirement for fund raising ability. I had been a key leader in local amateur radio clubs which exemplified my ability to lead volunteer groups. Most of all, however, I believe my talents as a businessman squarely addressed the job description's requirement to manage the business aspects of AMSAT.

ASR: Could you elaborate on the grants you obtained for science education?

N2CF: Over a period of 4 years I won 3 federal grants to improve science education in the classroom. Two grants were directly associated with space awareness themes. The first in 1977 provided an OSCAR receiving station. Later in 1978 I won a second grant to establish a weather fax station in the school. These were important in providing the students with a deeper, more tangible understanding of the concepts taught.

ASR: Do you see any benefits to AMSAT in your ability to win grants?

N2CF: Yes indeed! I see as one of my primary functions

the task of winning grants for AMSAT to finance our ongoing programs in space awareness and amateur satellite work. There are literally thousands of foundations across the country with money to donate to good causes. You just have to know how to apply for it. Moreover there are corporations with millions of dollars earmarked for organizations such as AMSAT. My plan is to move into this area promptly to develop this yet-untapped reservoir of financial resources. Secondarily, I will be looking towards individuals who have a particular interest in amateur radio and who may be able to give us some support. I personally know of several who might be convinced, given the correct approach, to writing rather large checks in favor of AMSAT. Primarily, though, I will be looking outside the amateur radio community for support; to the foundations and corporations. We will also be looking at some programs that could be self-sustaining; self-supporting so that they would not draw down existing resources. In this category we might fit OSCAR education through grants, AMSAT-developed software, certain aspects of the new PACSAT program and an envigorated trinket program. All these I see as contributing to the sustenance of AMSAT....our ability to finance our ambitious projects.

ASR: As General Manager will you be responsible for all these programs?

N2CF: Some projects I will oversee and others I will manage directly. But as I understand my responsibility, I will manage the overall effort with the help of key individuals throughout the organization.

ASR: Does your employment agreement provide an incentive for you to develop these revenue-producing programs?

N2CF: Part of my compensation from AMSAT is an incentive based on the donations and grants I obtain for AMSAT. Being a salesman at heart I'm delighted to have such an arrangement. It makes me strive even harder to obtain what we all want: a fiscally strong AMSAT. I will be launching several of my programs immediately upon taking office next month.

ASR: What plans do you have to take advantage of the launch of Phase IIIB to build AMSAT membership?

N2CF: I plan to use the core of AMSAT Area Coordinators in conjunction with W8GQW's proposed local network base to bring AMSAT's message to the large metropolitan areas in particular as soon as possible. We will transmit a basic, beginner's program on repeaters throughout the country to bring 15 or 30 minutes per week of OSCAR education to as many amateurs as possible. We may even take it one step further to where we promote affiliated clubs. The implication is clearly that exposure to the ideas will breed interest and interest will lead to new members.

ASR: What are your feelings on the balance between providing a stable satellite communication resource and advancing the state of the art?

N2CF: I believe we will always want to provide communications satellites for a vast number of users. By the same token, we have an obligation in our charter to pursue advanced modes and new technology. I'm particularly excited about PACSAT. I think it will influence amateur radio's future as much or more than Phase IIIB.

ASR: Why is that?

N2CF: PACSAT will open many doors in terms of ham radio's relation to rapidly growing computer technology. I'd like to see amateurs move into this area and to really take advantage of the possibilities that exist. The conjunction of these two technologies will determine in large measure the course of amateur radio henceforth, I'm convinced. It's therefore very prudent that AMSAT should be in the forefront.

ASR: How do you see AMSAT organization on an international scale?

N2CF: I look forward to supporting the AMSAT President in developing closer cooperative ties with the several affiliated AMSAT organizations. I believe the time is right for expanding on the strong bonds that already exist and hope that cooperative projects to build and launch spacecraft grow even stronger with the enlarged capability now evident in several countries.

ASR: What are your plans for relocating to the Washington area?

N2CF: For the first few months I will be splitting my time between the Washington office and my office in New York. This will allow me to begin my familiarization with the operation in Washington, to get several programs running while allowing me to tend to the business of preparing for a permanent relocation of my family. In addition, I will need to work with WA2LQQ to familiarize myself as much as possible with aspects of the publications end of AMSAT. I will be meeting with W1XT, KW2U, KB2M and others in the next month or so. In any case I will be permanently relocated in the D.C. area by summer, we hope.

ASR: As our General Manager do you plan to make presentations to amateur groups?

N2CF: I hope to be quite active and to travel widely to bring interesting presentations to groups around the country. I feel there is a real need to get out with a presence and bring our story right to club level. I want to help educate the amateur radio community to Phase IIIB and to share the excitement I feel about amateur satellites with all those who will listen.

ASR: When do you start work?

N2CF: April 25 I will be at work.

ASR: Will we see you at the Dayton Hamvention this year?

N2CF: Without a doubt! I look forward to it with great excitement.

ASR: Well congratulations, Bill, on your new job and we know all the AMSAT members are pulling for you. Do you have any closing remarks?

N2CF: The General Manager's position is a dream job for me. I couldn't have designed a more challenging, exciting circumstance myself! In the months ahead I look forward enthusiastically to meeting as many of the members as possible and to get their ideas too as to how best to make use of the opportunities that lie ahead. I want to encourage members to participate at the highest level they can and to help shape the organization for the exciting times that lie just ahead. AMSAT is one of the most significant forces in amateur radio today. I hope to advance our collective ideals and bring AMSAT to new

heights of success in both building spacecraft and promoting the fun and educational aspects of using them. And I look forward to working with you all in making these positive things come about starting right now. Thanks!

ASR: Thank you, Bill.

Short Bursts

•Launch campaign for Phase IIIB begins for AMSAT 22 April. W3GEY and W4PUJ travel to Kourou then. Between 25 April and 15 May the team from the U.S., West Germany and South Africa integrate the Phase IIIB spacecraft with the Ariane L6 launcher. This activity includes final checkout, filling the fuel and oxidizer tanks, mating to the launcher, etc. From then on to launch day, 3 June, the team will be babysitting the spacecraft!

•An amateur satellite station signing SPØSAT has been heard and worked in the U.S. and Europe. Word is that this is NOT a legal station and should be avoided to avert serious political and diplomatic implications. Apparently the station is connected with the underground and operates surreptitiously to avoid the authorities.

•Correction to recent *ASR* story by K1HTV re RS5 and RS7 telemetry. B. Lindholm correctly points out that there is no "E" channel and that the telemetry dwelling on "E01" should in fact read "EG01". It is the battery telemetry channel. Lindholm has observed other "dwell" modes on RS5 and 7 too. Examples cited are "G60" (battery); "IW14" ("S" meter of 2nd service receiver); and the "U" channel (7.5 volt regulator). Also possible spurious emissions from the RS5 bird. Sigs heard on 29.451 and 29.250 coincide with 29.351 xmns.

•KH6CC is now active from Hawaii. He's looking for eastern U.S. stations and has already notched a couple of New England states (NH, CT). Look for him about 5 kHz below the RS6 and RS8 beacons at about 29.445 and 29.495.

•The Jansky Commemorative operations at the National Radio Astronomy Observatory are planned for two weekends in May: 7-8 and 14-15. The EME activity on the second weekend is drawing enoromous amounts of interest since the 140' dish will allow EME contacts with WV by stations with very modest 70 cm equipment suites. Many AMSAT Phase IIIB, Mode B stations will be tuning up their rigs using the EME run as preparation and check out prior to Phase IIIB launch in June. W3IWI reports that the primary call used at NRAO will be K8HUH with W3IWI as backup. K8HUH will xmit 432.095-432.100 MHz and listen 432.000-432.200 MHz. The wide band for listening is designed to accommodate the crush expected to attend this event. K8HUH will xmit LHCP so be prepared to receive RHCP as the sense is reversed by reflection from the moon. *ASR* is planning extensive coverage of both weekends of the Jansky commemoration. Stay tuned!

•The planned Mode J balloon launch from Transvaal Province, South Africa, 19 March was again postponed. Problems with the low pressure balloon system caused the second delay in as many attempts. The plan is to carry a Mode J transponder to 26 miles (42 km). Next attempt will be on 26 March when the project leader ZS6AKV, Hans, says they will use only the high pressure balloon system while the low pressure balloon system undergoes additional design and repair work to repair leaks that developed. Later, given that the payload is successfully recovered from the 26 March launch, another full-up attempt will be made this spring with both the high and low pressure balloon systems.

•More reports of super-satellite DX. H44PT reports hearing KE7P at 1018 UTC on 6 March. Peter is unsure which satellite KE7P was heard on but he later also heard himself presumably on the same bird indicating, perhaps, the possibility of some really long DX promoted by an exotic propagation mode.

•Area Coordinators: a new functional directory is on its way to you. Check your listing for accuracy. Report errors to K1HTV so they may be purged next time.

•WØRPK has been named to organize the Phase IIIB ALINS (AMSAT Launch Information Network/Service). This effort will be the largest ever attempted and will include global coverage including live feeds from important facilities supporting the launch and tracking effort. More on this to follow.

•W8GQW is developing a concept to establish dozens of community-based OSCAR interest groups using news provided by *ASR* and the nets to local organizers. They would convene local nets weekly on repeaters and handle questions and answers from interested newcomers. Large metropolitan areas are primary targets but any area which can put together at least a small working/interest group should contact W8GQW to work out the details and make suggestions as to the best approach while the effort is in the planning stage. New General Manager N2CF plans to build on this concept to strengthen the organization (see interview elsewhere in the issue).

•VE3EFX presented a lively OSCAR talk to an enthusiastic crowd of listeners in Waterloo, Ontario, 7 March. Bill presented a narrated slide show featuring OSCAR, answered many questions from the audience and played audio tapes of the sounds of UoSAT. The digitalker was especially fascinating to the audience Bill says. Phase IIIB and PACSAT also raised interest levels in the audience. The splendid 90 minute program given by VE3EFX was one of the best ever according to host VE3KVR, President of the Kitchener Waterloo ARC. Bill had a supply of literature and handouts provided by Martha at AMSAT HQ. Telemetry decoding guides were popular items. Bill feels many new AMSAT memberships will result from his presentation. FB to VE3EFX!

ASE Bulletin Board Hours

About 100 new users have appeared on the AMSAT Software Exchange Bulletin Board since N5AHD's story appeared in *Orbit* #12. Bob would like to remind everyone that the hours of operation of the ASE BB are:

Monday thru Thursday 0500 to 2300 UTC

Friday thru Sunday 0500 to 1200 UTC

Please note that the times are in UTC and represent the MINIMUM available times. Availability at other times is possible but less certain.

PACSAT Design Meeting Held

A kickoff meeting to begin the design phase of PACSAT was held at the Goddard Space Flight Center, Greenbelt, Maryland on 25-27 February. The meeting attracted attendees from as far as England and California.

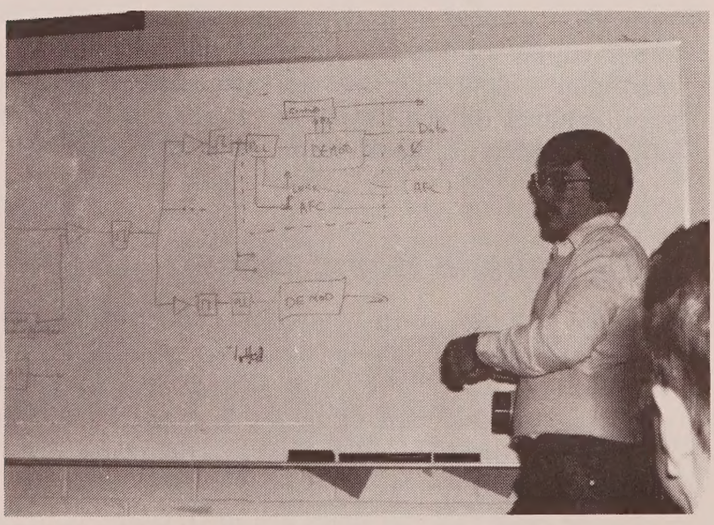
Called the PACSAT Conceptual Design Meeting, the discussions got under way Friday evening with more than 15 in attendance. Two special guests were presented to the group which included senior managers from AMSAT, AMRAD, TAPR, SLAPR and others. (TAPR is Tuscon Area Packet Radio and SLAPR is St. Louis Area Packet Radio.) The special guests were Mr. Henry Norman and Mr. Robert Reining of VITA, the Volunteers In Technical Assistance. Mr. Norman, who is VITA Executive Director explained that VITA is a 4,000 member organization devoted to the application of technical solutions to problems in underdeveloped Third World nations. For example, VITA has been active in developing wind energy electric systems for rural village electrification.

Mr. Norman explained that VITA was interested in a PACSAT-like satellite to reduce the international communications problems incurred in supporting VITA field operations and for responding to technical inquiries from remote villages where help is needed. The store-and-forward concept appears a viable solution Mr. Norman added.

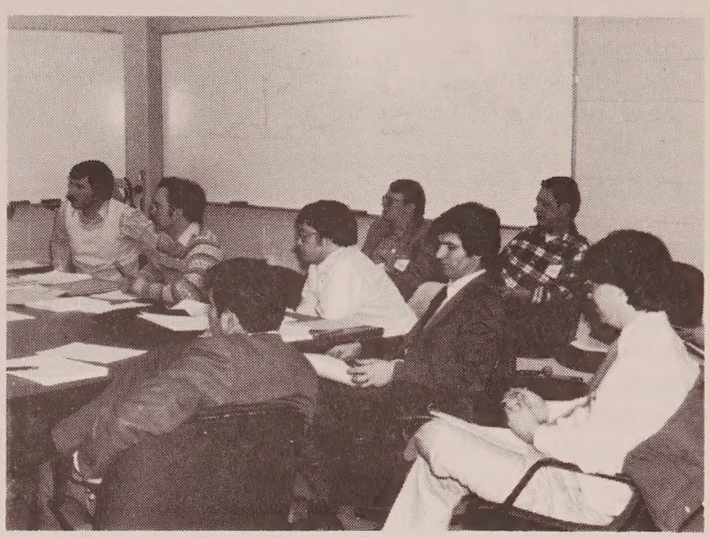
A high degree of commonality would exist between an amateur radio PACSAT-device and a satellite built for VITA. In fact, it was pointed out that the overall design would be virtually alike. Thus, the design of one would fill the needs of both organizations. VITA has advanced $15,000 in a grant to begin the design conceptualization of PACSAT.

Dr. Martin Sweeting, G3YJO, UoSAT Project Manager, suggested the possibility of his group at Surrey working in the area of spacecraft development, structure, bus systems and mechanical requirements.

Leading the weekend meeting, PACSAT Project Manager Den Connors, KD2S, discussed the ties between AMSAT and TAPR. He discussed the roles of PACSAT, research and development, gateway stations, user networks and interconnectivity.



Den Connors, KD2S, PACSAT Project Manager describes one design approach.



(L-R) D. Connors, M. Sweeting, H. Norman, H. Price, W. Reed, P. Barlow, P. Rinaldo, R. Reining.

Paul Rinaldo, W4RI, who will be moving to head the ARRL Technical Department, said he will be bringing a new awareness of digital technology with him to Newington.

The weekend's agenda was then detailed and agreed upon. Jan King, W3GEY, discussed launch opportunities for the next several years. He cited possibilities including Delta/D (1985), Shuttle (1984-1989), Landsat Recovery mission (1986), Space Services International (1985) and the Japanese H-1 (1986). Jan emphasized the significance of being allowed to deploy a satellite from a Shuttle-borne GAS (Get Away Special) canister called a GAS Can. This possibility is being pursued with NASA by various interested parties including AMSAT. Jan also elaborated on a fascinating scheme he and Karl Meinzer, DJ4ZC, devised to use water as a propellant to take a small payload from a Shuttle (very low) orbit to a more useful one similar to AO-8 or even as high as AO-7. One version of the Meinzer/King strategm would use an electric powered steam jet generator to boost the satellite orbit in small spurts over a period of weeks or months. The advantage of this, Jan pointed out, was that the extremely tight safety requirements associated with a manned mission (such as Shuttle) could more easily be met with a safe propellent such as water. The alternative would be to propose the use of various rocket propellants. These would be much more difficult to qualify and thus much more expensive, Jan said. The steam generator idea will be carried forward.

The discussions then moved to issues involving legal, regulatory, fiscal and management matters. The importance of electronic mail systems was discussed as was the importance of the adequate utilization of available AMSAT talent.

The meeting then turned to the "proof of concept" experiment to advance two of AMSAT's fundamental objectives: 1. Utilization of low earth orbits and 2. Use of inexpensive satellite technology. It was remarked that it might be both possible and desirable to use existing UoSAT capability to demonstrate the store-and-forward concept. Mr. Norman indicated that there was a very large potential interest in the PACSAT concept and that

all available communications channels should be used to generate interest and revenues. These should include using Voice of America to explain the concept and generate interest around the world. Problems involving thrid party agreement constraints were discussed and it was pointed out that the proof of concept should be (could be) coordinated with certain key United Nations agencies to generate favorable publicity and support both in the United States and abroad. Internal communications were discussed as well.

The Saturday meeting, led by KD2S, centered on highly technical discussion on such matters as possible PACSAT modulation schemes (Phil Karn, KA9Q), link calculations, access techniques, protocols, radiation hardness of the design, power, antennas power and simulators. Jan presented an outline of spacecraft design considerations.

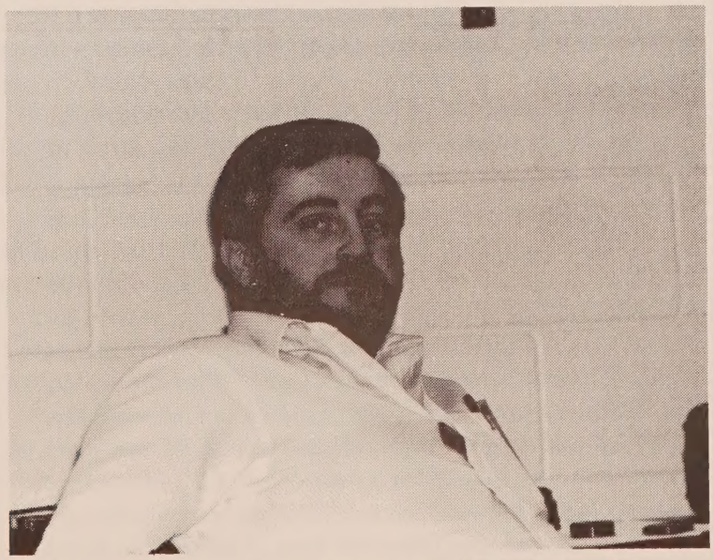
On Sunday the meeting continued with spacecraft interface design discussions and assignment of areas of responsibility as well as applicable standards for an interface specification.

Several attendees went home Sunday with specific action items. Port Barlow, WB1DCP, was to generate minutes of the meeting and publish same. The next meeting was set for the Second ARRL Packet Radio Conference in San Francisco 18-20 March.

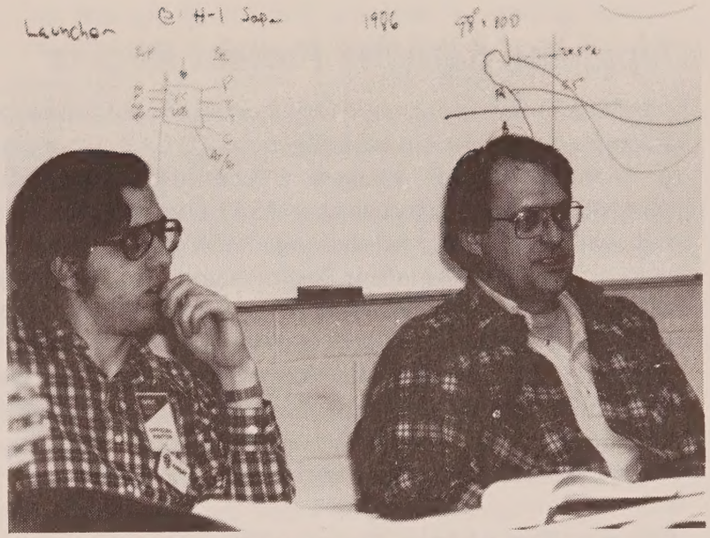
Meeting attendees included: M. Saragovitz; H. Norman (VITA); R. Reining (VITA); M. Sweeting, G3YJO; D. Connors, KD2S; H. Price, NK6K; P. Barlow, WB1DCP; P. Rinaldo, W4RI; R. Zwirko, K1HTV; T. Clark, W3IWI; J. King, W3GEY; R. Daniels, W4PUJ; C. Murcko, N2AOL; R. Sorenson, KM2T; W. Reed, WDØETL; D. Bordon, K8MMO; T. Fox, WB4JFI; J. Skoog, WDØEEL; and V. Riportella, WA2LQQ.

Microwaves Pinpoint Fallen Skiers

Not as traditional as a Saint Bernard or as warming as a shot of brandy, Recco's microwave avalanche rescue system should nevertheless be most welcome to hapless skiers and mountaineers buried beneath deep drifts. The Swedish company will market the system developed by the Royal Institute of Technology in Stockholm.



WA2LQQ, *ASR* Editor, attends the PACSAT Meeting.



KA9Q and W3IWI at recent PACSAT Meeting.

Similar in concept to the microwave detection systems used by department stores to catch shoplifters, the Swedish equipment radiates a directional signal that can be picked up by self-adhesive stickers attached to a cautious skier's boots or clothing. The sticker has a diode and a miniature antenna that will reradiate harmonics of an intercepted rescue system signal.

The searchers carry a packframe-mounted transmitter and receiver, headphones, and a hand-held scanning antenna. The detection equipment will locate avalanche victims at snow depths up to 32 feet with an accuracy to within one foot. Depending on the outside temperature, a fully charged battery will last for up to two hours.

A person buried under an avalanche has an 80% chance of survival if found within 10 minutes. After two hours, the odds drop to 20%. For this reason, the Swedish company recommends that its system be used by helicopter rescue teams.

Tracking System Available

The AMSAT AMS-81 Tracking System will be available for distribution starting April 15, 1983. The program requires a Sinclair ZX-81 or Times Sinclair TS-1000 computer and 16K of memory and provides scheduling and tracking information for Phase II and Phase III type orbits.

Send check or money order for $15 made out to AMSAT to:

AMSAT AMS-81 Tracking System
c/o Bob McCaffrey, KØCY
3913 29th Street
Des Moines, Iowa 50310

Bob's crew will start shipping the third week of April.

The tracking system will also be available at the Midwest Division Convention during the weekend of April 15th and at the Dayton hamvention the weekend of April 29th. AMSAT leaders wanting quantities for sale at other gatherings should contact Martha at AMSAT HQ.

Japanese Satellite Project Begins

JAMSAT, the Japanese AMSAT affiliate will soon be designing and building an indigenous OSCAR according to JAMSAT/AMSAT Liaison Officer Harry Yoneda, JA1ANG. Harry also serves as AMSAT Director. The project will be a joint undertaking of JARL and NASDA. (JARL is the Japan Amateur Radio League; NASDA is the National Space Development Agency [of Japan]; similar to NASA, ESA). JAMSAT will provide key technical support in areas of design, development, test and integration. Dubbed JAS-1 for Japanese Amateur Satellite #1, the project was recently approved by Japanese authorities after several years of behind the scenes negotiations. The sensitive nature of the negotiations precluded earlier announcements according to JAMSAT officials. A 1986 launch is anticipated.

Mikiyasu (Miki) Nakayama, JR1SWB, will head the JAMSAT team as task leader for the project. It is not clear at this juncture what the final name of the satellite will become. This will be Japan's first satellite although JAMSAT has been a very active contributor to prior projects. Most prominent is AMSAT-OSCAR 8 where JAMSAT built the Mode J (for JAMSAT) transponder. Several

Moon Tracking Basic Program

(Author K2UYH; translation to M Basic by W.H. Calvin QSP by W1HDX)

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2000 'MOON.BAS from a TDL BASIC program found by J.L.DuBois 1/83
2010 M0=17472.5 : SX=60 : TN=10
2020 M1=.214:M2=.114 : M3=.272 : M4=.146 : M5=.059 : M6=.057 : M7=61.33 : M8=1440
2030 U1=.751213 : U2=.036601102000000003#: U3=.822513 : U4=.0362916 : U5=.995766
2040 G1=.397821 : G2=.917463 : G3=.658 : G4=6.289 : G5=1.274 : G6=.186
2050 G7=.6593 : G8=6.2303 : G9=5.144 : K=2
2060 U6=2.73778E-03 : U7=.974271: U8=.0338632 : U9=.0312525 : U0=.0367482
2070 Q0=4.1645=3 : Q1=.0657098 : Q2=1.00274 : Q3=6.64606 : HR=24
2080 DEF FNA(X)=INT(X*DG*100+.5)/100
2090 DEF FNC(X)=(X-INT(X))*TU
2100 HD=100
2110 TU=2*4*ATN(1)
2120 RD=TU/360
2130 DG=360/TU
2140 INPUT "Name of site";C$
2150 IF C$="" THEN C$="Cardenas Hilltop" : AD=36.03 : OD=111.87 :GOTO 2180
2160 INPUT "What is latitude (in decimal fraction degrees)";AD
2170 INPUT "What is longitude (decomal fraction degrees)";OD
2180 LA=AD : LO=OD
2190 LO=LO/DG : LA=LA/DG
2200 BE=100
2210 B1=0
2220 E=2400
2230 INPUT "Time interval between points (minutes)";DI
2240 IF DI=0 THEN DI=30
2250 ME=0
2260 NR=1
2270 INPUT "Beginning date (mm/dd/yyyy)";M$
2280 'to check program, enter no date and see if 0000Z gives GHA=45.7,DE=-22.2
2290 IF M$="" THEN M$="06/23/1972"
2300 M=VAL(MID$(M$,1,2)) : D=VAL(MID$(M$,4,2)) : Y=VAL(MID$(M$,7,4))
2310 PD=1000
2320 PA=LA : PO=LO
2330 IF Y<100 THEN Y=Y+1900
2340 GOSUB 3160
'find Julian date for beginning day
2350 BM=M : BD=D : BY=Y : BJ=DJ
2360 INPUT "End date ";M$
2370 IF M$<>"" THEN 2380 ELSE D=D+1 : GOTO 2400
2380 M=VAL(MID$(M$,1,2)) : D=VAL(MID$(M$,4,2)) : Y=VAL(MID$(M$,7,4))
2390 IF Y<100 THEN Y=Y+1900
2400 GOSUB 3160
 'find Julian date
2410 EJ=DJ
 'set end date
2420 INPUT "Line printer? Y/N(N)";P$
2430 IF P$="Y" OR P$="y" THEN LP=1
2440 PRINT CHR$(26)
2450 IF LP=1 THEN LPRINT CHR$(12);CHR$(6);CHR$(2);CHR$(30);
2460 BJ=INT(BJ*HD+.5)/HD     'round off Julian date to nearest hour
2470 EJ=INT(EJ*HD+.5)/HD
2480 DJ=BJ
2490 PRINT TAB(22);"Moon Tables for ";C$
2500 IF LP=1 THEN LPRINT TAB(22);"Moon Tables for ";C$
2510 F7=0
2520 F1=2 : B=B1 : T1=DJ-M0
2530 V1=((B-INT(B/HD)*HD)+INT(B/HD)*SX)
2540 V2=((E-INT(E/HD)*HD)+INT(E/HD)*SX) : DF=V1-V2
2550 IF DF<=0 THEN 2580
2560 IF DF>=DI THEN 3100
2570 B=D
2580 T=(B-INT(B/HD)*HD)/M8+INT(B/HD)/HR
2590 IF F1>=2 THEN 2630
2600 IF F2>=NE THEN 2630
2610 F2=F2+1
2620 GH=GH+Q0*DI : GOTO 2780
2630 F2=0 : T5=T1+T
2640 D1=FNC(U1+U2*T5) : D2=FNC(U3+U4*T5) : D3=FNC(U5+U6*T5)
2650 D4=FNC(U7+U8*T5) : D5=FNC(U9+U0*T5)
2660 D0=D1+G3*RD*SIN(K*D4)+G4*RD*SIN(D2)
2670 D0=D0-G5*RD*SIN(D2-K*D4)-G6*RD*SIN(D3)
2680 D0=D0+M1*RD*SIN(K*D2)-M2*RD*SIN(K*D5)
2690 D0=D0-M5*RD*SIN(K*D2-K*D4)-M6*RD*SIN(D2+D3-K*D4)
2700 S=D5+G7*RD*SIN(K*D4)+G8*RD*SIN(D2)-M3*RD*SIN(D2-K*D4)
2710 DT=G9*RD*SIN(S)-M4*RD*SIN(D5-K*D4)
2720 E1=COS(DT)+SIN(D0)*G1+SIN(DT)*G2 : DC=ATN(E1/(SQR(1-E1^2)))
2730 A2=COS(DT)*COS(D0)/COS(DC)
2740 A1=(COS(DT)*SIN(D0)*G2-SIN(DT)*G1)/COS(DC)
2750 A=ATN(A1/A2) : GOSUB 3340 : RA=A
2760 DL=Q1*T1 : DL=T*HR*Q2+Q3+(DL-INT(DL/HR)*HR)
2770 DL=(DL-INT(DL/HR)*HR) : GH=(DL/HR)*TU-RA
2780 IF GH>=0 THEN 2800
2790 GH=GH+TU
2800 IF GH<=TU THEN 2820
2810 GH=GH-TU
2820 UH=LO-GH
2830 ES=COS(LA)*COS(UH)*COS(DC) + SIN(DC)*SIN(LA)
2840 EC=SQR(1-ES^2) : EL=ATN((ES/EC)-(1/(M7*EC))) : FE=ATN(ES/EC)
2850 IF EL<0 THEN 3060
2860 'IF EL*DG >BE THEN 980
2870 AZ=(COS(LA)*SIN(DC)-SIN(LA)*COS(-UH)*COS(DC))/COS(FE)
2880 IF ABS(AZ)>=1 THEN AZ=(1-SGN(AZ))*TU/4 :GOTO 2910
2890 AZ = TU/4 - ATN( AZ/SQR(1-AZ*AZ))
2900 IF SIN(-UH)>0 THEN AZ=TU-AZ
2910 IF F1<2 THEN 2990
2920 M$=STR$(BM) : M$=MID$(M$,2,2) : D$=STR$(BD) : D$=MID$(D$,2,2)
2930 BT=BY-1900
2940 Y$=STR$(BT) : Y$=MID$(Y$,2,2)
2950 PRINT M$;"/";D$;"/";Y$;"  GMT";TAB(16);"AZIMUTH";
2960 IF LP=1 THEN LPRINT M$;"/";D$;"/";Y$;"  GMT";TAB(16);"AZIMUTH";
2970 PRINT TAB(25);"ELEVATION";TAB(37);"GHA";TAB(43);"DECLINATION"
2980 IF LP=1 THEN LPRINT TAB(25);"ELEVATION";TAB(37);"GHA";TAB(43);"DECLINATION"
2990 IF (T-E1)-(K*DI)/M8<0 THEN 3020
3000 'PRINT
3010 'IF LP=1 THEN LPRINT
3020 PRINT USING "####";B;
3030 PRINT USING "      ###.##";FNA(AZ),FNA(EL),FNA(GH),FNA(DC)
3040 IF LP=1 THEN LPRINT TAB(5);INT(B+.5);TAB(16);FNA(AZ);TAB(27);FNA(EL);TAB(36);FNA(GH);TAB(46);FNA(DC)
3050 F1=T
3060 B=B+DI : Z=((B-INT(B/HD)*HD)-SX)
3070 IF Z<0 THEN 2530
3080 B=INT(B/HD)*HD + HD + Z
3090 GOTO 2530
3100 GOSUB 3440
3110 DJ=INT(DJ*HD+.5)/HD : F7=F7+1
3120 IF F7=NR AND LP=1 THEN LPRINT CHR$(12) : F7=0
3130 DJ=DJ+1
3140 IF DJ<=EJ THEN 2520
3150 END
3160 IF (Y-1853)/4<11 THEN 3190
3170 C1=-1
3180 GOTO 3200
3190 C1=0
3200 IF M=9 THEN 3240
3210 IF M=11 THEN 3240
3220 C2=0
3230 GOTO 3250
3240 C2=1
3250 IF M>=3 THEN 3300
3260 X1=365*(Y-1853)+D+30*(M+9)+INT((M+10)/2)
3270 X2=INT((Y-1853)/4)+1+C1
3280 DJ=X1+X2
3290 RETURN
3300 X3=365*(Y-1852)+D+30*(M-3)+INT((M-2)/2)
3310 X4=INT((Y-1852)/4)+C1+C2
3320 DJ=X3+X4
3330 RETURN
3340 IF A<>0 THEN 3380
3350 IF A2<0 THEN 3370
3360 RETURN
3370 A=TU/2 : RETURN
3380 IF A>0 THEN 3420
3390 IF A2<0 THEN 3410
3400 A=TU+A : RETURN
3410 A=TU+(A-TU/2) : RETURN
3420 IF A2>=0 THEN RETURN
3430 A=A+TU/2 : RETURN
3440 IF BD<28 THEN 3610
3450 IF BM<>2 THEN 3500
3460 IF 400*INT(BY/400)=BY THEN 3490
3470 IF HD*INT(BY/HD)=BY THEN 3580
3480 IF 4*INT(BY/4)<>BY THEN 3580
3490 IF BD>=29 THEN 3580 ELSE 3610
3500 IF BD<30 THEN 3610 ELSE IF BD>30 THEN 3550
3510 IF BM=4 THEN 3580
3520 IF BM=6 THEN 3580
3530 IF BM=9 THEN 3580
3540 IF BM<>11 THEN 3610 ELSE 3580
3550 IF BM<>12 THEN 3580
3560 BY=INT((BY+1)*HD+.5)/HD
3570 BM=0
3580 BD=1
3590 BM=BM+1
3600 GOTO 3620
3610 BD=BD+1
3620 RETURN
3630 'TRANSLATED TO MBASIC 2/6/83 W.H.CALVIN
```

of the key components of both Phase IIIA and B also were JAMSAT contributions.

JAS-1 will be placed in an 1500 km circular orbit inclined 50 degrees. It will be very similar to AO-7 in its orbit. According to JR1SWB the payload will include both a Mode J-type linear transponder and a PACSAT-like digital transponder. The launch vehicle will also be indigenous to Japan. The H-1 launcher has recently enjoyed good success in placing communications and weather satellites in service for the Japanese growing requirements.

JR1SWB is currently in the U.S. attending the West Coast Computer Faire in San Francisco. Later he will travel east visiting key AMSAT officials including KA9Q and W1HDX. Miki represented JAMSAT at the Paris conclave of amateur satellite builders last October and is a recognized leader in the community.

ASR *Spotlight On: WØRPK*

Ralph Wallio, WØRPK, is an outstanding example of the kind of volunteer whose dedication and expertise has made AMSAT the thriving organization it is today.

His superlative handling of AMSAT matters at the recent ARRL National Convention in Cedar Rapids, Iowa, needs no further belaboring here—see *ASR* #39 for an idea of what Ralph accomplished.

While organizing the AMSAT effort at Cedar Rapids may be the most visible evidence of WØRPK's effectiveness in AMSAT organizational matters, it must be remembered that a good many years of experience, dedication and interest preceded and led up to that effort.

Ralph got his novice ticket back in 1957 as the result of attending classes put on by a science teacher and an assistant principal—both hams—at the junior high school Ralph then attended.

Later, a general class ticket, DX100, and NC109 were the main ingredients in the AM and CW station of W9JPR.

"If you sandpapered your fingertips, it was possible to receive sideband with that equipment, but it wasn't easy," Ralph said.

Reading about satellites in *QST* developed an interest in the birds and resulted in the acquisition of an Ameco TX62 converter, a varactor tripler and a Collins KWM 1.

The Collins was a great piece of gear, but it had one grievous fault for OSCAR Mode B users—it worked on upper sideband only.

This made it somewhat difficult to receive the inverted 2-meter signals sent back by OSCAR 6, so most of Ralph's work with the satellites of that era was on cw.

Today Ralph has an Icom 251, Microwave Modules for 70 cm., and an Advanced Receiver Research preamp.

Back in the 70's, he started a satellite user's net on one of the local repeaters in Chicago, became even more interested in AMSAT, and volunteered his services for whatever use could be made of them.

His first job for AMSAT was making mailing labels.

On moving to Iowa in 1977, Ralph found the Area Coordinator job vacant and volunteered for the post. Over the next few years, he put on quite a number of seminars and demonstrations and in general became rather deeply immersed in AMSAT affairs.

Satellites are a boon to hams like Ralph with an interest in vhf. WØRPK lives on a five-acre farm, complete with horses, at an altitude of about 800 feet, but completely surrounded by 950-foot hills.

Ralph, a communications engineer and designer of telecommunications systems, is not the only technically-oriented member of the family. His wife is director of the computer center at nearby Simpson College.

And WØRPK says another lady of the family, Stephie, who attained fours years of age in August, was of inestimable help in setting up and taking down the AMSAT exhibits at the Cedar Rapids convention.

With the impending launch of Phase IIIB, it is entirely possible, evenly likely, an influx of users will develop which will heavily tax the user-oriented administrative arm of the organization.

If this indeed turns out to be the case, then AMSAT can consider itself fortunate to have access to the services of the likes of Ralph Wallio, WØRPK.

AMSAT congratulates this distinguished Life Member from the heart of America. Ralph's continued participation in technical and management team efforts mark him for key future leadership roles in both domains!

WØRPK at the 1982 ARRL National Convention.

Correction factors to Project OSCAR Calendar

(per N3AR)

AO-8	+177 seconds +1°
RS-5	+45 seconds
RS-6	−55 seconds
RS-7	−51 seconds
RS-8	+22 seconds

UOSAT SPACECRAFT CONTROL CENTRE
UNIVERSITY OF SURREY, GUILDFORD, SURREY, ENGLAND
****

UOSAT SPACECRAFT OPERATIONAL STATUS:
****
**** UOSAT BULLETIN-17 1500 GMT 18 MARCH 1983 ****

** S/C NEWS **

FOLLOWING PRECISE NAVIGATION ANALYSIS AND ATTITUDE MANOEUVRES DURING MARCH 3-6TH, UOSAT WAS SUCCESSFULLY ORIENTED IN THE CORRECT MANNER AND TIME FOR GRAVITY GRADIENT STABILISATION. BOOM DEPLOYMENT COMMENCED OVER SURREY AT 03:58:15 GMT. AT 04:00:35 HIGH SPEED DATA INDICATED THE CABLES FROM THE SPACECRAFT TO THE TIP-MASS MAGNETOMETER ON THE END OF THE BOOM TO HAVE SNAGGED AND BOOM DEPLOYMENT WAS HALTED IMMEDIATELY AT ONE METRE EXTENSION. THE NAVIGATION AND ATTITUDE OF UOSAT WAS SO PRECISE HOWEVER THAT THE SPACECRAFT SUCCEEDED IN BECOMING GRAVITY-GRADIENT STABILISED FOR APPROX ONE DAY EVEN THOUGH THE BOOM WAS ONLY EXTENDED 1 RATHER THAN 4M. THE GRADUAL INCREASE IN Z-SPIN CAUSED UOSAT TO SLIP OUT OF LOCK ON 8 MARCH. DETAILED ANALYSIS IS UNDER WAY AND ATTEMPTS WILL BE MADE TO RELEASE THE CABLES.

** THANKS FOR FEEDBACK **

W4AUZ, I.CLINE, WA6VRC, K1KSY, N5AHD, WB4KGY, G8EDG, W7AVE, KA9Q/2, G6ESK, G6BTU, G8NEF, G8NOB

** POST BOX **

PLEASE SEND RAW TELEMETRY AND COMPUTER DUMP DATA RECEIVED FROM ORBITS 7770 TO 7865 FOR DETAILED ANALYSIS.

SPACECRAFT ORBITAL DATA

ORBITS FOR 18TH MARCH

	UOSAT	OSCAR-8	NOAA-7	
ORBIT NO :	8000	25654	8939	
EQX TIME :	14:12:56	15:00:43	14:23:08	GMT
EQX LONG :	345.6	181.8	357.7	DEG.W
MEAN HGT :	505.6	905.0	850.0	KM
PERIOD :	94.7279624	103.1672360	101.9113575	MINS
P-DRAG :	5.718E-05	2.166E-06	7.500E-06	*N-REF
LONG INC :	23.6815572	25.7936732	25.4882122	DEGS
L-DRAG :	1.438E-05	7.030E-07	2.000E-07	*N-REF

QSL/POST CARDS CONFIRMING RECEPTION OF UOSAT DATA INCLUDING STATION DETAILS WOULD BE APPRECIATED FOR SURVEY OF NO. AND GEOGRAPHIC DISTRIBUTION OF ACTIVE STATION)
SEND TO: DR.M.N.SWEETING, UOSAT CONTROL CENTRE - THANK YOU

AMSAT 10101 10000 00100 10000 01110 00111 00001 10001 00000
AMSAT 10101 10000 00100 10000 01110 00111 0p001 10001 00000
00114 01320 02763 03001 04001 05433 06180 07492 08433 09376
10100 11090 12000 13366 14315 15591 16716 17385 18440 19425
20160 21150 22747 23044 24008 25417 26424 27278 28478 29395
30450 31440 32667 33225 34012 35356 36409 37399 38487 39399
40080 41100 42741 43002 44041 45000 46001 47467 48485 49496
50090 51090 52274 53121 54620 55702 56463 57474 58485 59459

20 Mar 83 1830 hrs UTC

#29 Tip mass Uncaged → #30 Speech Synth. On

AMSAT 10101 10000 00100 10000 01110 00111 00001 10001 00000
AMSAT 10101 10000 00100 10000 01110 00111 00001 10001 00000
00110 01250 02763 03001 04001 05370 06180 07492 08433 09375
10100 11100 12000 13366 14308 15736 16507 17487 18440 19426
20160 21160 22748 23064 24007 25417 26425 27272 28478 29396
30440 31460 32667 33230 34012 35356 36410 37399 38487 39397
40080 41100 42739 43005 44037 45000 46001 47467 48485 49496
50090 51090 52274 53107 54674 55721 56464 57474 58485 59459

AMSAT 10101 10000 00100 10000 01110 00111 00001 10001 00000
AMSAT 10101 10000 00100 10000 01110 00111 00001 10001 00080
00110 01210 02763 03001 04001 05306 06180 07492 08433 09374
10100 11100 12000 13366 14309 15808 16160 17637 18440 19427
20160 21160 22748 23084 24008 25417 26427 27273 28478 29398
3 420 31470 32667 33230 34012 35356 36409 37399 38487 39394
40080 41100 42740 43009 44042 45000 46001 47467 48485 49496
50090 51090 52274 53093 54733 55725 56463 57474 58485 59459

Orbital Information from KA9Q

noaa-7:
Wed Mar 23 00:27:43 1983 UTC: Ascending node at 141.7 west
Nodal period: 101.97758 min
Longitude increment: 25.493097 deg w/orbit
Element set #189
Element set epoch: Wed Mar 9 03:20:03 1983 UTC

oscar-7:
Wed Mar 23 00:45:40 1983 UTC: Ascending node at 106.8 west
Nodal period: 114.93917 min
Longitude increment: 28.736762 deg w/orbit
Element set #478
Element set epoch: Tue Nov 30 09:46:21 1982 UTC

oscar-8:
Wed Mar 23 00:20:05 1983 UTC: Ascending node at 86.1 west
Nodal period: 103.16860 min
Longitude increment: 25.794456 deg w/orbit
Element set #738
Element set epoch: Wed Mar 9 11:21:13 1983 UTC

oscar-9:
Wed Mar 23 01:33:49 1983 UTC: Ascending node at 155.4 west
Nodal period: 94.72004 min
Longitude increment: 23.678993 deg w/orbit
Element set #430
Element set epoch: Wed Mar 9 09:10:30 1983 UTC

rs-3:
Wed Mar 23 00:27:50 1983 UTC: Ascending node at 163.1 west
Nodal period: 118.51965 min
Longitude increment: 29.756723 deg w/orbit
Element set #51
Element set epoch: Mon Mar 7 03:13:34 1983 UTC

rs-4:
Wed Mar 23 00:31:54 1983 UTC: Ascending node at 159.7 west
Nodal period: 119.39325 min
Longitude increment: 29.975306 deg w/orbit
Element set #86
Element set epoch: Wed Mar 2 01:05:22 1983 UTC

Satellite: oscar-7
Catalog number: 7530
Epoch time: 82334.40718817
Tue Nov 30 09:46:21 1982 UTC
Element set: 478
Inclination: 101.3994 deg
RA of node: 336.3150 deg
Eccentricity: 0.0011748
Arg of perigee: 269.7184 deg
Mean anomaly: 90.2542 deg
Mean motion: 12.53379655 rev/day
Decay rate: -2e-08 rev/day^2
Epoch rev: 36792
Semi major axis: 7829.772 km
Anom period: 114.889371 min
Apogee: 1481.375 km
Perigee: 1462.978 km

Satellite: oscar-8
Catalog number: 10703
Epoch time: 83068.47307508
Wed Mar 9 11:21:14 1983 UTC
Element set: 738
Inclination: 98.7647 deg
RA of node: 85.9388 deg
Eccentricity: 0.0006149
Arg of perigee: 240.9085 deg
Mean anomaly: 119.1450 deg
Mean motion: 13.96542417 rev/day
Decay rate: 5e-08 rev/day^2
Epoch rev: 25532
Semi major axis: 7285.338 km
Anom period: 103.111798 min
Apogee: 927.624 km
Perigee: 918.664 km
Translate freq: 581.0974 mhz
Invert: 1
Beacon: 435.0965 mhz

Satellite: oscar-9
Catalog number: 12888
Epoch time: 83068.38229543
Wed Mar 9 09:10:30 1983 UTC
Element set: 430
Inclination: 97.5334 deg
RA of node: 34.3297 deg
Eccentricity: 0.0002377
Arg of perigee: 343.9221 deg
Mean anomaly: 16.1774 deg
Mean motion: 15.21002555 rev/day
Decay rate: 8.581e-05 rev/day^2
Epoch rev: 7862
Semi major axis: 6882.471 km
Anom period: 94.674397 min
Apogee: 507.574 km
Perigee: 504.302 km
Beacon: 145.8250 mhz

Satellite: rs-3
Catalog number: 12997
Epoch time: 83066.13442376
Mon Mar 7 03:13:34 1983 UTC
Element set: 51
Inclination: 82.9566 deg
RA of node: 32.5955 deg
Eccentricity: 0.0057336
Arg of perigee: 247.5980 deg
Mean anomaly: 111.9005 deg
Mean motion: 12.15575337 rev/day
Decay rate: 4e-08 rev/day^2
Epoch rev: 5403
Semi major axis: 7991.328 km
Anom period: 118.462423 min
Apogee: 1677.006 km
Perigee: 1585.368 km

Satellite: rs-4
Catalog number: 13000
Epoch time: 83061.04539515
Wed Mar 2 01:05:22 1983 UTC
Element set: 86
Inclination: 82.9513 deg
RA of node: 39.6370 deg
Eccentricity: 0.0017673
Arg of perigee: 328.6822 deg
Mean anomaly: 31.3187 deg
Mean motion: 12.06664550 rev/day
Decay rate: 1.12e-06 rev/day^2
Epoch rev: 5302
Semi major axis: 8030.608 km
Anom period: 119.337226 min
Apogee: 1672.347 km
Perigee: 1643.962 km

Satellite: rs-5
Catalog number: 12999
Epoch time: 83068.44366646
Wed Mar 9 10:38:53 1983 UTC
Element set: 75
Inclination: 82.9575 deg
RA of node: 36.3273 deg
Eccentricity: 0.0009828
Arg of perigee: 353.8432 deg
Mean anomaly: 6.2513 deg
Mean motion: 12.05036616 rev/day
Decay rate: 1.1e-07 rev/day^2
Epoch rev: 5384
Semi major axis: 8037.837 km
Anom period: 119.498444 min
Apogee: 1667.834 km
Perigee: 1652.035 km

Satellite: rs-6
Catalog number: 13002
Epoch time: 83049.15195035
Fri Feb 18 03:38:49 1983 UTC
Element set: 49
Inclination: 82.9567 deg
RA of node: 42.9474 deg
Eccentricity: 0.0049012
Arg of perigee: 299.0670 deg
Mean anomaly: 60.5489 deg
Mean motion: 12.13552535 rev/day
Decay rate: 2.1e-07 rev/day^2
Epoch rev: 5188
Semi major axis: 8000.203 km
Anom period: 118.659882 min
Apogee: 1677.360 km
Perigee: 1598.939 km

Satellite: rs-7
Catalog number: 13001
Epoch time: 83069.08834491
Thu Mar 10 02:07:13 1983 UTC
Element set: 92
Inclination: 82.9548 deg
RA of node: 34.2072 deg
Eccentricity: 0.0020821
Arg of perigee: 272.2609 deg
Mean anomaly: 87.6066 deg
Mean motion: 12.08675885 rev/day
Decay rate: 7.7e-07 rev/day^2
Epoch rev: 5408
Semi major axis: 8021.700 km
Anom period: 119.138639 min
Apogee: 1681.288 km
Perigee: 1647.884 km

Satellite: rs-8
Catalog number: 12998
Epoch time: 83067.06522777
Tue Mar 8 01:33:56 1983 UTC
Element set: 196
Inclination: 82.9407 deg
RA of node: 37.9790 deg
Eccentricity: 0.0019883
Arg of perigee: 26.0256 deg
Mean anomaly: 334.1769 deg
Mean motion: 12.02935946 rev/day
Decay rate: 2.01e-06 rev/day^2
Epoch rev: 5358
Semi major axis: 8047.189 km
Anom period: 119.707122 min
Apogee: 1689.099 km
Perigee: 1657.098 km

Satellite: noaa-7
Catalog number: 12553
Epoch time: 83068.13893285
Wed Mar 9 03:20:04 1983 UTC
Element set: 189
Inclination: 98.9842 deg
RA of node: 31.2713 deg
Eccentricity: 0.0013515
Arg of perigee: 334.2264 deg
Mean anomaly: 25.8238 deg
Mean motion: 14.12849879 rev/day
Decay rate: 2.98e-06 rev/day^2
Epoch rev: 8804
Semi major axis: 7229.187 km
Anom period: 101.921656 min
ApogeeHe: 864.757 km

Amateur Satellite Report is published and mailed First Class bi-weekly by The Radio Amateur Satellite Corporation, P.O. Box 27, Washington, DC 20044 for the purpose of enhancing communications about the Amateur Radio Satellite Program. Subscription rate is $18.00 ($26.00 overseas) yearly by check or money order to "Satellite Report," 221 Long Swamp Road, Wolcott, CT 06716. Information published herein may be quoted without permission provided credit is given. Amateur Satellite Report is endorsed by the American Radio Relay League as the special interest newsletter serving the Amateur Radio Satellite Community. The editorial opinions expressed are not necessarily those of the ARRL.